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NASA's Voyager Spacecraft: A Fact Sheet

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Summary

Voyager 1 and 2 were launched in 1977 with the mission of returning data from Jupiter and Saturn and other planets as they flew past them. Their current mission is to extend NASA's exploration of the outermost edge of the solar system and the region where the sun's influence ends. In the 28th year after their 1977 launches, they each are much farther away from Earth and the sun than Pluto. These unmanned vehicles have garnered broad congressional and public interest.

In light of funding constraints, the issue has arisen as to whether the National Aeronautics and Space Administration (NASA) will opt to shut down the Voyager 1 and 2 spacecraft or any of several other spacecraft. NASA will decide which missions to continue operating based on the level of funding available and NASA's Senior Management Review ranking of the science value provided by each of these spacecraft. This ranking is expected later this year or early next year. This report is updated regularly.

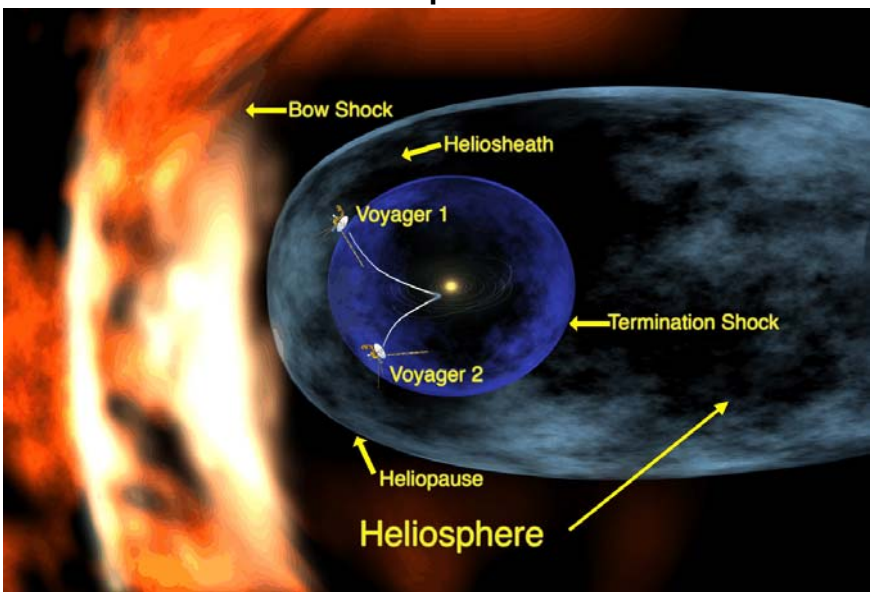
Background

Voyager 2 was launched on August 20, 1977, from Cape Canaveral, Florida aboard a Titan-Centaur rocket. On September 5, 1977, Voyager 1 was launched, also from Cape Canaveral aboard a Titan-Centaur rocket. The primary mission for both spacecraft was the exploration of Jupiter and Saturn. After making a string of discoveries there — such as active volcanoes on Jupiter's moon Io and intricacies of Saturn's rings — the mission was extended. Between them, Voyager 1 and 2 explored the four giant planets of our outer solar system, Jupiter, Saturn, Uranus, and Neptune, 48 of their moons, and the system of rings and magnetic fields those planets possess. Voyager 1 was put into a faster, shorter trajectory, so it reached Jupiter first and returned data about Jupiter and Saturn. Voyager 2 returned data about Jupiter, Saturn, Neptune, and Uranus.

Both Voyagers continue to return data as they travel through the outer reaches of the solar system. The current mission of the two spacecraft is designated as the Voyager Interstellar Mission (VIM). Its objective is to extend NASA's exploration of the outermost edge of the solar system and the region where the sun's influence ends. In the

28th year after their 1977 launches, they each are much farther away from Earth and the Sun than Pluto. Voyager 1 is farther from Earth than any other human-made object. The Voyager probes are approaching the boundary region — the heliopause — where the Sun's dominance of the environment ends and interstellar space begins **(Figure 1)**. Both spacecraft are still sending scientific information back to NASA's Deep Space Network (DSN). NASA believes both spacecraft will continue to operate and send back valuable data until at least the year 2020 when the plutonium power source will run out. Detailed information on Voyager is available at [http://voyager.jpl.nasa.gov/].

Figure 1. Voyager Spacecraft Approaching the Heliopause



Source: NASA at [http://voyager.jpl.nasa.gov/]

Voyager's Future

Voyager 1 and 2 are funded as part of NASA's Earth-Sun System theme in the Science Mission Directorate. A total of 13 spacecraft in the Earth-Sun System category, including the two Voyagers, are conducting "extended missions" — that is, they have achieved their primary objectives, but continue to operate because they are still providing useful scientific data. Initially, NASA indicated that it might not receive sufficient FY2006 funding to continue operating all of these spacecraft, including the Voyagers. The White House on July 15, 2005, submitted a NASA FY2006 budget amendment to Congress, which includes approximately $16 million to maintain the continued operation of the spacecraft conducting space and solar physics missions [http://www.whitehouse.gov/omb/budget/amendments/amendment_7_15_05.pdf]. This funding would enable the continued operation for at least part of FY 2006 of the following seven missions: Voyager, Ulysses, Transition Region and Coronal Explorer (TRACE), Fast Auroral SnapshoT Explorer (FAST), Geotail, Wind, and Polar. Detailed information on these and other space science missions can be found at [http://spacescience.hq.nasa.gov/missions]. The Voyager probes would consume approximately $4.2 million of that total. For more information on NASA's FY2006 Budget see CRS Report RL32988, *The National Aeronautics and Space*

Administration's FY2006 Budget Request: Description, Analysis, and Issues for Congress by Marcia S. Smith and Daniel Morgan.

NASA will decide which missions to continue operating based on the level of funding provided to NASA by Congress and NASA's Senior Management Review ranking of the science value provided by each of these spacecraft. Senior Management Review is a process which uses scientists outside of NASA to independently review and rank the science value for each extended mission.

109th Congress Legislative Activities

H.R. 3070, the National Aeronautics and Space Administration Authorization Act of 2005, passed the House on July 22, 2005, and is currently in the Senate Committee on Commerce, Science, and Transportation. Section 304 would require NASA to carry out annual termination reviews within each of the science disciplines to assess the cost and benefits of extending the date of the termination of data collection for those missions which are beyond their primary goals. In addition, within 60 days after the date of enactment, NASA would carry out such an assessment for the following missions: FAST, TIMED, Cluster, Wind, Geotail, Polar, TRACE, Ulysses, and Voyager. NASA would be required to submit the assessments to the Senate Committee on Commerce, Science, and Transportation and the House Committee on Science within 30 days after completing each assessment.

S. 1281, the National Aeronautics and Space Administration Authorization Act of 2005, was reported out of the Senate Committee on Commerce, Science, and Transportation (S.Rept. 109-108, July 26, 2005) and is currently on the Senate Calendar. Section 144 would require NASA, within 60 days after the date of enactment, to carry out an assessment of the costs and benefits of extending the date of the termination of data collection from the Ulysses spacecraft and the Voyager spacecraft. NASA would be required to submit a report on the assessment to the Senate Committee on Commerce, Science, and Transportation and the House Committee on Science within 30 days after completing the assessment.